SEACON

CS-MS

UNDERWATER ELECTRICAL DRY-MATE CONNECTORS

TE connectivity

SECTION **PAGE**

CS-MS SERIES

Introduction ..... CSMS 2
Availability ..... CSMS 2
Applications ..... CSMS 2
Testing ..... CSMS 2
Special Assemblies ..... CSMS 2
Part Number System ..... CSMS 2
General Information ..... CSMS 3
In-Line Cable ..... CSMS 3

Dimension Details:
- CS-MS-BCR ..... CSMS 4
- CS-MS-CCP ..... CSMS 4
- CS-MS-CCP OVERMOLD (J & K SIZE) ..... CSMS 5
- 90 DEGREE CCP-PBOF ADAPTER (J & K SIZE) ..... CSMS 5
- CS-MS-1FO-BCR ..... CSMS 6
- CS-MS-1FO-CCP ..... CSMS 6
- CS-MS-SCR ..... CSMS 7
- CS-MS-SCP ..... CSMS 7
- CS-MS-BMHB ..... CSMS 8

Interface Details ..... CSMS 8

Contact Configurations ..... CSMS 9

INTRODUCTION

With ever increasing demands being placed on many areas within the Oil and Gas industry, greater challenges are being placed on connectors used in many applications within these markets. One application facing the biggest challenge is the ROV industry as many ROV's are now being required to operate at greater depths resulting in an increase for specialized equipment to meet the environmental conditions imposed on them today. This has driven connector manufacturers to push the limitations of existing connector designs as well as developing new connector solutions to meet the specific and varied requirements of the application.

The CS-MS series is the result of a collaboration between SEACON and C.R. Encapsulation in providing a connector that is specifically developed to meet the needs of ROV manufacturers and their equipment suppliers.

AVAILABILITY

The standard Aluminum shell connector is designed to accommodate an oil filled hose. It can also be molded to a variety of industrial cables if so specified by the customer. This new high specification and high integrity series fits industry standard bulkhead interfaces and is available by special order in alternate materials. Single way fiber optic and hybrid versions also available.

APPLICATIONS

In addition to ROV systems, the CS-MS series is suitable for a variety of applications including underwater cameras and lights, diver communications, recreational submersibles, towed-array cable systems, current meters, animal migration and research and food processing equipment.

TESTING

The CS-MS has undergone complete Qualification testing including:-

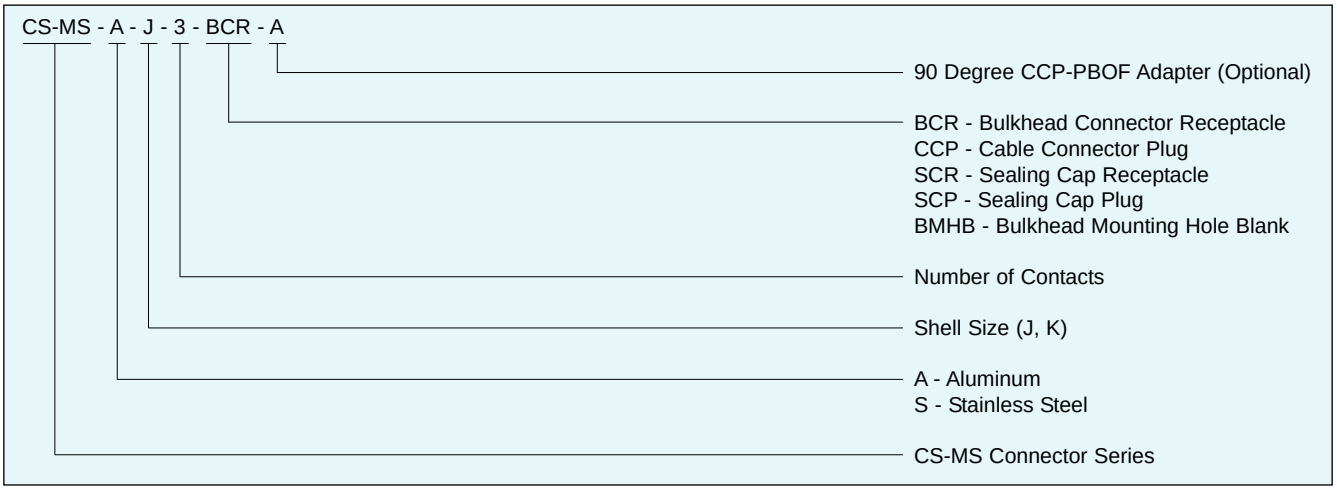
- Insulation resistance testing at >1 Gohms @ 500 VDC.
- Pressure testing up to 7,000 psi.
- Durability testing with 250 mate and de-mate cycles with no change in conductor or insulation resistance readings.

SPECIAL ASSEMBLIES

SEACON maintains all facilities necessary to furnish complete underwater and environmental electrical connector/cable systems, including Research and Development, Engineering, Manufacturing, Quality Control and Pressure Testing. As well as supplying our standard 'off-the-shelf' items, we have the capability to design and manufacture **SPECIAL CUSTOMIZED CONNECTORS AND CABLE ASSEMBLIES** to suit your individual needs. SEACON also prides itself with the ability to perform stringent quality conformance testing procedures which are in accordance with the MIL-SPEC programs.

Please contact SEACON for further information.

PART NUMBER SYSTEM


CS-MS - A - J - 3 - BCR - A
90 Degree CCP-PBOF Adapter (Optional)
BCR - Bulkhead Connector Receptacle
CCP - Cable Connector Plug
SCR - Sealing Cap Receptacle
SCP - Sealing Cap Plug
BMHB - Bulkhead Mounting Hole Blank
Number of Contacts
Shell Size (J, K)
A - Aluminum
S - Stainless Steel
CS-MS Connector Series

GENERAL INFORMATION

CATEGORY	MATERIAL
BCR/CCP/SCP/SCR/BMHB BODY **STANDARD** **OPTIONAL**	 Aluminum 6061-T6, Hard Anodized 316 Stainless Steel / Titanium
CONTACTS	Copper Alloy Gold Plated
O-RING	Nitrile (formerly known as Buna N)
ENGAGING NUT	Aluminum 6061-T6, Hard Anodized
RETAINING RING	Stainless Steel 420
WASHER	Black Delrin® (DuPont trademark for Acetal Resin)
CCP OVERMOLD* **STANDARD LENGTH**	CS-3, 5 & 7 pin Neoprene #18 AWG (SO Cable) CS-9 & 10 pin Neoprene #20 AWG 18 inches

CATEGORY	VALUE
OPEN FACE PRESSURE	5,900 psi / 4,000m (J size) 7,000 psi / 4,780m (K size)
MATED PRESSURE	5,900 psi / 4,000m (J size) 7,000 psi / 4,780m (K size
OPERATING TEMPERATURE	-30°C to 70°C (-22°F to 158°F)
BULKHEAD MOUNTING TORQUE	100 inch lbs (installation into dry metal threads) 20 inch lbs (installation into dry plastic threads)
INSULATION RESISTANCE	>1 Gohms @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	<0.5 mA @ 1,000 VAC
MATING CYCLES WITH NO CHANGES IN RESISTANCE OR IR READING	>250

NOTES:

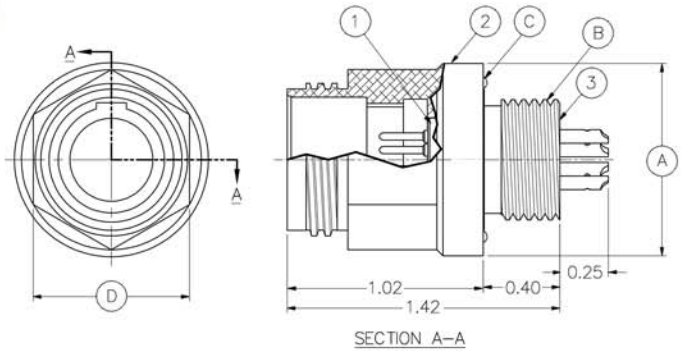
Contact **SEACON** for special order materials.
Connectors are designed for installation on one atmosphere vessels. Contact **SEACON** for recommendations if using compensated vessels.
* Incorporation of special cables will be determined on a case by case basis.

IN-LINE CABLE

CS-MS-J-3#16	18/3 SO Neoprene jacket, rubber insulated 7 amp (500 VDC). Color code; contact 1 white, contact 2 black, contact 3 green.
CS-MS-J-5#16	18/5 SO Neoprene jacket, rubber insulated 6 amp (400 VDC). Color code; contact 1 white, contact 2 black, contact 3 green, contact 4 red, contact 5 orange.
CS-MS-J-9#20	20/10 Neoprene jacket, rubber insulated 2.5 amp (300 VDC). Color code; contact 1 white, contact 2 black, contact 3 green, contact 4 red, contact 5 orange, contact 6 blue, contact 7 white/black, contact 8 red/black, contact 9 green/black, contact 10 orange/black (not connected).
CS-MS-K-7#16	18/7 SO Neoprene jacket, rubber insulated 5 amp (500 VDC). Color code; contact 1 white, contact 2 black, contact 3 green, contact 4 red, contact 5 orange, contact 6 blue, contact 7 white/black.
CS-MS-K-10#20	20/10 Neoprene jacket, rubber insulated 2.5 amp (200 VDC). Color code; contact 1 white, contact 2 black, contact 3 green, contact 4 red, contact 5 orange, contact 6 blue, contact 7 white/black, contact 8 red/black, contact 9 green/black, contact 10 orange/black.

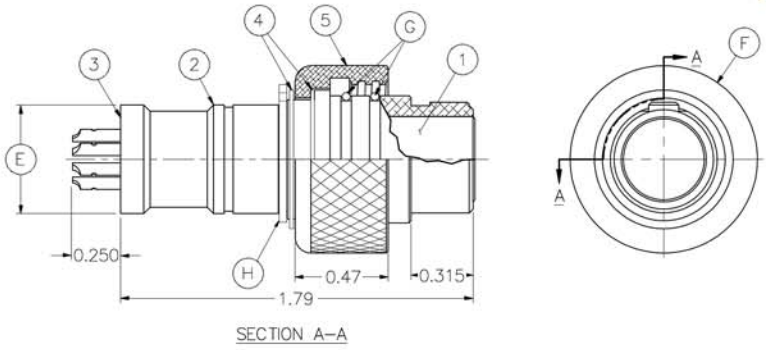
CS-MS SERIES
CS-MS-BCR

CS-MS Bulkhead Connector Receptacle
Mates with CS-MS-CCP
Dummy Connector: CS-MS-SCP



CS-MS SERIES
CS-MS-CCP

CS-MS Cable Connector Plug
Mates with CS-MS-BCR
Dummy Connector: CS-MS-SCR



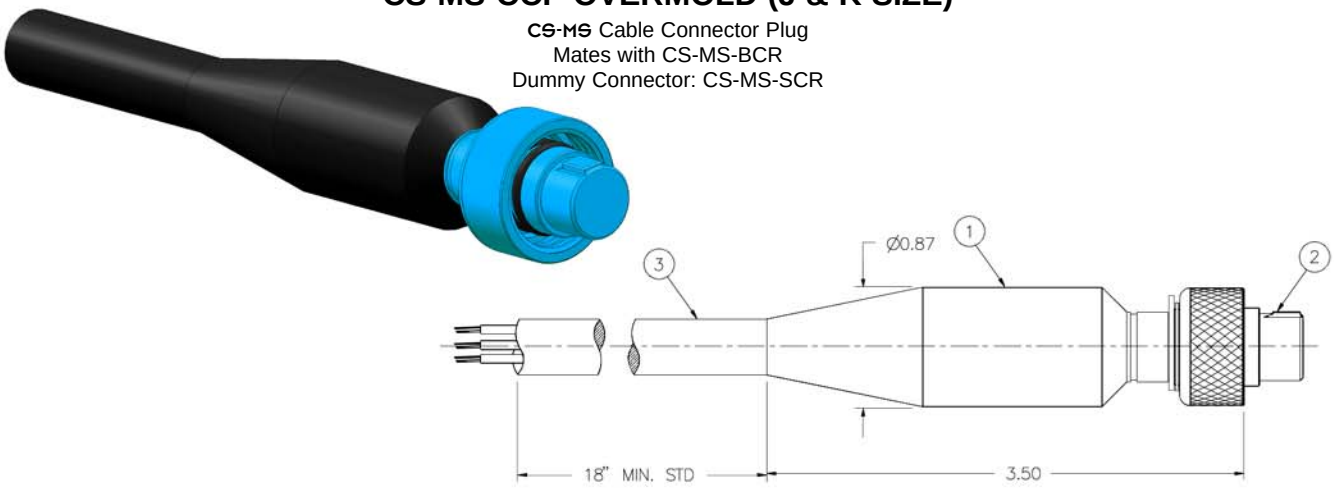
CONNECTOR	A - Ø (INCHES)	B - THREAD	C - O-RING	D - HEX FLATS (INCHES)	E - Ø (INCHES)	F - Ø (INCHES)	G - O-RING	H - RETAINING RING
CS-MS-J-BCR / CCP	0.95	9/16-18 UNF-2A	5-254	0.75	0.51	0.88	2-013	11-40393-1
CS-MS-K-BCR / CCP	1.00	5/18-18 UNF-2A	06-10707-1	0.81	0.55	0.96	06-10531-1	11-40551-1

NOTES:
1 - CS-MS-CIR / CIP: Glass Reinforced Epoxy and Copper Alloy Gold Plated contacts / sockets.
2 - CS-MS-BCR / CCP SHELL: Aluminum 6061-T6, Hard Anodized.
3 - POTTING: White Epoxy.
4 - WASHER: Delrin® (DuPont trademark for Acetal Resin).
5 - ENGAGING NUT: Aluminum 6061-T6, Hard Anodized.

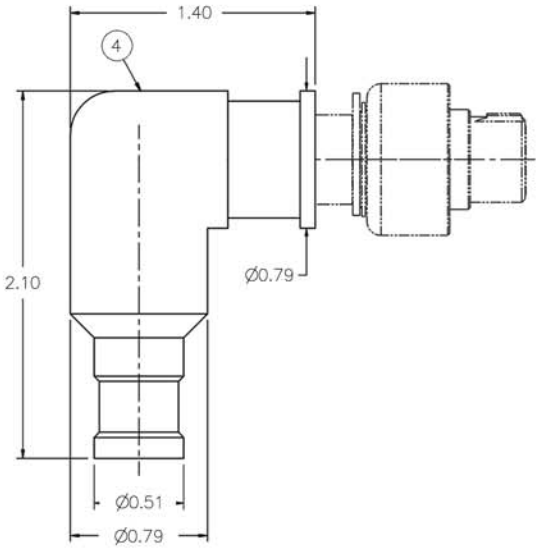
· O-ring is shown as reference only, it is not installed and is supplied separately. Insert o-ring is supplied fitted.
· Overmolding optional please see page 4 for details.
· Please refer to page 7 for Bulkhead Mounting Hole Blank details.
· Please refer to page 8 for contact configurations available.

CS-MS SERIES
CS-MS-CCP OVERMOLD (J & K SIZE)

CS-MS Cable Connector Plug
Mates with CS-MS-BCR
Dummy Connector: CS-MS-SCR



CS-MS SERIES
90 DEGREE CCP-PBOF ADAPTER
(J & K SIZE)



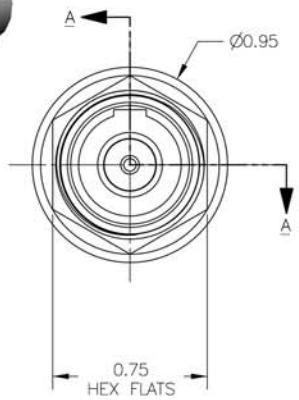
NOTES:
1 - CS-MS-CCP OVERMOLD: Neoprene.
2 - CS-MS-CCP ASSY: Metal Shell & Glass Reinforced Epoxy insert.
3 - CABLE: Neoprene. Maximum cable diameter 0.55.
4 - 90 DEGREE CCP-PBOF ADAPTER: Black Polyurethane body & Stainless Steel barb. Sold separately.

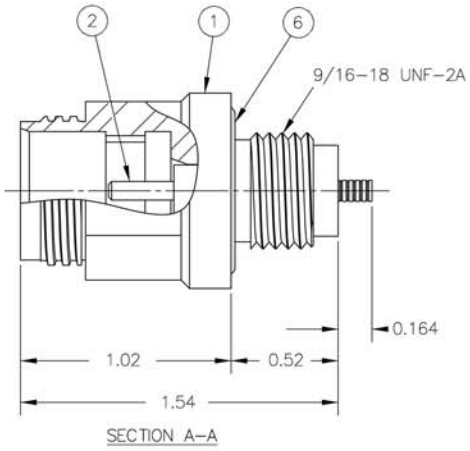
· CS-MS-CCP OVERMOLD: Right angle version available.

· 90 DEGREE CCP-PBOF ADAPTER: Please see page 3 for further information.

CS-MS SERIES
CS-MS-1FO-BCR

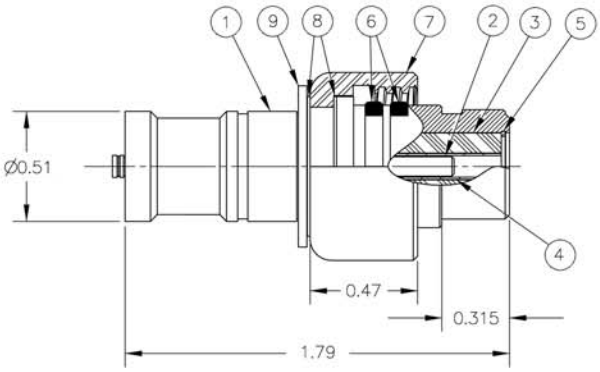
CS-MS Bulkhead Connector Receptacle
Mates with CS-MS-1FO-CCP

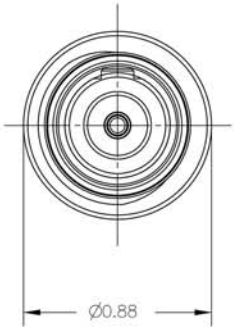




CS-MS SERIES
CS-MS-1FO-CCP

CS-MS Cable Connector Plug
Mates with CS-MS-1FO-BCR





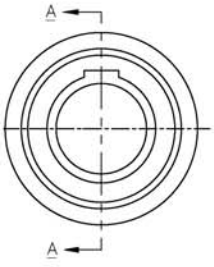
NOTES:
1 - CS-MS-BCR / CCP SHELL: Aluminum 6061-T6 or 6061-T6511. Hard Anodized.
2 - FIBER OPTIC CONTACT ASSEMBLY: HOUSING; 316 Stainless Steel. CONTACT; Zirconia Ceramic.
3 - ALIGNMENT SLEEVE ADAPTER: Delrin® (DuPont trademark for Acetal Resin).
4 - ALIGNMENT SLEEVE: Zirconia Ceramic.
5 - INTERNAL RETAINING RING: 316 Stainless Steel.
6 - O-RING: Nitrile (formerly known as Buna N).
7 - ENGAGING NUT: Aluminum 6061-T6 or 6061-T6511. Hard Anodized.
8 - WASHER: Delrin® (DuPont trademark for Acetal Resin).
9 - RETAINING RING: (P/N: 11-40393-1); 420 Stainless Steel.

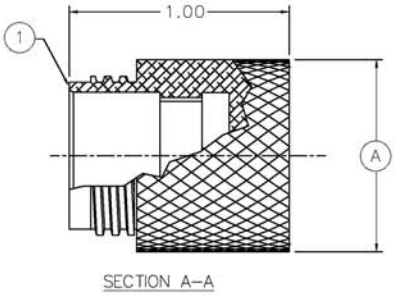
· Typical insertion loss <0.3dB.

· CS-MS-1FO-CCP - Pressure Balanced Oil Filled (PBOF) version only.

CS-MS SERIES
CS-MS-SCR

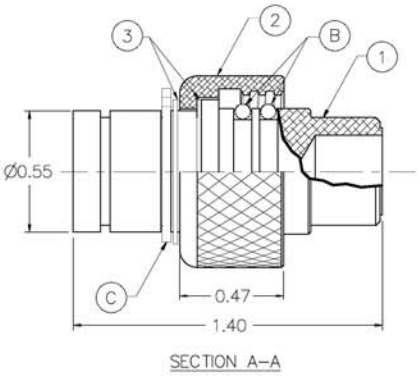
CS-MS Sealing Cap Receptacle
Mates with CS-MS-CCP

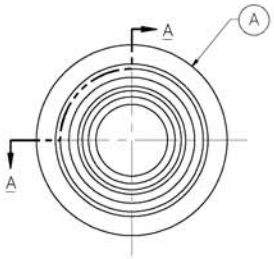




CS-MS SERIES
CS-MS-SCP

CS-MS Sealing Cap Plug
Mates with CS-MS-BCR



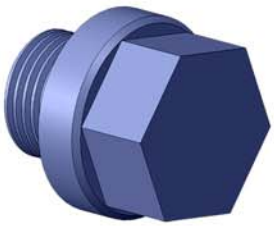


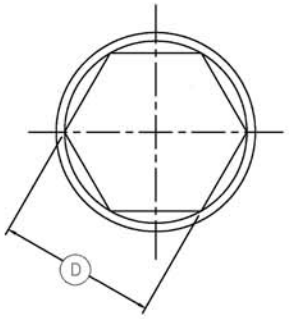
CONNECTOR	A - Ø (INCHES)	B - O-RING *	C - RETAINING RING
CS-MS-J-SCR / SCP	0.88	2-013	11-40551-1
CS-MS-K-SCR / SCP	0.96	06-10531-1	11-40551-1

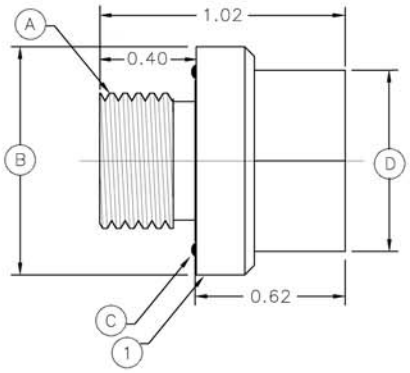
NOTES:
1 - CS-MS-SCR / SCP SHELL: Aluminum 6061-T6, Hard Anodized.
2 - ENGAGING NUT: Aluminum 6061-T6, Hard Anodized.
3 - WASHER: Delrin® (DuPont trademark for Acetal Resin).

· * O-ring is shown as reference only, it is not installed and is supplied separately.

CS-MS SERIES
CS-MS-BMHB
CS-MS Bulkhead Mounting Hole Blank





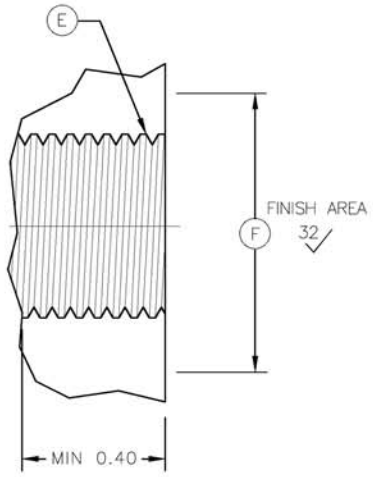


CONNECTOR	A - THREAD	B - Ø (INCHES)	C - O-RING *	D - HEX FLATS (INCHES)
CS-MS-J-BMHB	9/16-18 UNF-2A	0.95	5-254	0.75
CS-MS-K-BMHB	5/8-18 UNF-2A	1.00	06-10707-1	0.81

NOTES:
1 - CS-MS-BMHB SHELL: Aluminum 6061-T6, Hard Anodized.

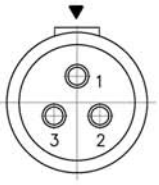
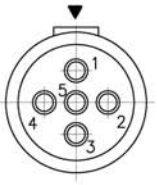
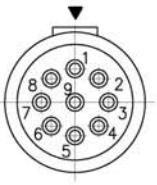
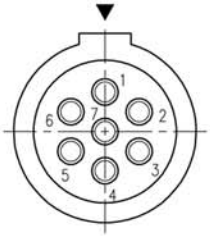
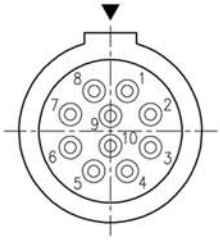
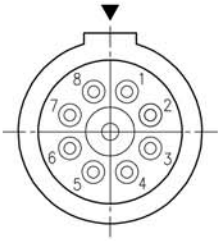
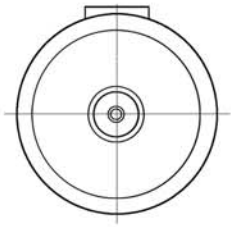
· * O-ring is shown as reference only, it is not installed and is supplied separately.

CS-MS SERIES
CS-MS
INTERFACE DETAILS
Mounting Information



CONNECTOR	E - THREAD	F - MIN Ø (INCHES)	MOUNTING TORQUE (INCH-POUNDS) **	
			METALLIC HOUSING	NON-METALLIC HOUSING
CS-MS-J	9/16-18 UNF-2B	1.00	100	20
CS-MS-K	5/8-18 UNF-2B	1.06	100	25

NOTES:
· ** Torque values refers to installation into dry threads.

SIZE	CS-MS SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)*
J	 3#16 500 VDC 13 amps  5#16 400 VDC 13 amps  9#20 300 VDC 4 amps
K	 7#16 500 VDC 13 amps  10#20 300 VDC 4 amps**  1F0/8#20 300 VDC 4 amps
	CS-MS FIBER OPTIC SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)*
	 1FO

NOTES:

· * For female face view contact configurations available please contact SEACON.

· ** For aluminum only.

Cable selection can impact voltage and amperage ratings.

SEACON GLOBAL PRODUCTION
Callejon Terrazos #8, Local 2-C, Las Brisas 1ra. Seccion,
Tijuana, B.C., Mexico C.P. 22610.
TEL: +52 (664) 626-2726
FAX: +52 (664) 686-8922
E-Mail: sales@seaconglobal.com
Website: www.seaconglobal.com
Dial from U.S.A. TEL: +1 (619) 308-7901
TOLL FREE: (888) 562-7072
FAX: +1 (619) 308-7900

SEACON
1700 Gillespie Way,
El Cajon, California 92020, USA.
TEL: +1 (619) 562-7071
FAX: +1 (619) 562-9706
E-Mail: seacon@seaconworldwide.com
Website: www.seaconworldwide.com

SEACON US GULF AREA SALES OFFICE
14511 Old Katy Road, Suite 300,
Houston, Texas 77079, USA.
TEL: +1 (281) 599-3509
FAX: +1 (281) 599-3517
E-Mail: gulfcoastsales@seaconworldwide.com
Website: www.seaconworldwide.com

SEACON ENCAPSULATING AND MOLDING FACILITY
1718 Fry Road, Suite 250,
Houston, Texas 77084, USA.
TEL: +1 (281) 394-0216
E-Mail: moldingshop@seaconworldwide.com
Website: www.seaconworldwide.com

SEACON US EAST COAST SALES OFFICE
15 Gray Lane, Suite 108, Hopkinton Industrial Park,
Ashaway, Rhode Island 02804, USA.
TEL: +1 (401) 637-4952
FAX: +1 (401) 637-4953
E-Mail: eastcoastsales@seaconworldwide.com
Website: www.seaconworldwide.com

SEACON ADVANCED PRODUCTS, LLC
1321 Nelius Road, P.O. Box 767,
Bellville, Texas 77418, USA.
TEL: +1 (979) 865-8846
FAX: +1 (979) 865-8859
E-Mail: sales@seacon-ap.com
Website: www.seacon-ap.com

SEACON BRAZIL
Rua Conde de Bonfim 120 sala 212, Tijuca,
Rio de Janeiro, Brazil, CEP: 20520-053.
TEL #1: +55 (21) 3592-0920
TEL #2: +55 (21) 3594-0920
CELL: +55 (21) 98849-3336
E-Mail: renata@seacon-ap.com
Website: www.seaconworldwide.com

SEACON (europe) LTD
Seacon House, Hewett Road, Gapton Hall Industrial Estate,
Great Yarmouth, Norfolk, NR31 0RB, UK.
TEL: +44 (0) 1493-652733
FAX: +44 (0) 1493-652840
E-Mail: sales@seaconeurope.com
Website: www.seaconeurope.com

SEACON PHOENIX
15 Gray Lane, Suite 108, Hopkinton Industrial Park,
Ashaway, Rhode Island 02804, USA.
TEL: +1 (401) 637-4952
FAX: +1 (401) 637-4953
E-Mail: sales@seaconphoenixllc.com
Website: www.seaconphoenix.com

Even though these procedures appear simple, only qualified technicians should perform the installation and maintenance. Connectors are designed for installation on one atmosphere vessels. Contact SEACON for recommendations if using compensated vessels.

INSTALLATION PROCEDURES

Torque values referenced in this literature assume installation into dry metal threads. For other applications, please contact SEACON for recommendations. All connectors should be clean and free from moisture prior to mating. **Bulkhead Connector Receptacle (BCR):** Lubricate the BCR o-ring with an appropriate silicone grease before installing. This lubrication should be applied to form an adequate film. Excessive lubrication is detrimental to the operation of the connector.

Cable Connector Plug (CCP): Lubricate the o-ring and sealing areas using an appropriate silicone grease (the engaging nut can be moved back to provide access to these seals). The retaining ring will need to be moved to the alternate groove provided for this purpose. After the seals are replaced, the nut and ring will need to be put back in their working positions.

CARE AND MAINTENANCE

After mating, the CS-MS connector requires no maintenance. It is recommended that upon disconnecting or retrieving a system that utilizes the CS-MS series, the CS-MS connectors should be dried, cleaned, regreased and remated prior to deploying or storage. It is recommended that when not mated, the BCR or CCP should be protected with a Sealing Cap Receptacle (SCR) or Sealing Cap Plug (SCP).

CABLE AND CONTINUITY PRESERVATION

Avoid sharp bends in cables. Cables subjected to vibration and exposed to seawater drag should be adequately clamped to prevent fatigue and possible failure.

FIBER OPTIC MAINTENANCE INSTRUCTIONS

- All Fiber Optic connectors should be covered with a protective cap while not in use.
- Fiber handling is important when dealing with Fiber Optic connectors.
- Do not exceed the bend radius of any given fiber.
- The face of a Fiber Optic ferrule should not come into contact with any abrasive material.
- Cleaning of a Fiber Optic ferrule should be done with Isopropyl Alcohol and a soft foam swab or applicant.
- “Clean” ferrule protectors should be placed over the ferrule when not in use.
- Connectors should be stored in a rigid container to prevent damage to fiber.
- Fiber should be stored in a vertical manner, preferably on a spool to maintain the proper bend radius.
- Airborne contaminants on the face of a ferrule can decrease the performance of a Fiber Optic connection.
- Lube the mating seals as needed to provide proper fit, form and function.
- Do not look directly into Fiber Optic connectors.

All reasonable efforts have been taken to ensure that the information contained herein is accurate at the date of publication, but no representation or warranty as to the accuracy or completeness of such information is intended or to be implied by its inclusion herein. Any and all representations and warranties pertaining to the information and products referred to herein shall be set forth in SEACON standard sales order form. In addition, SEACON reserves the right to make changes to the contents hereof without notice, therefore it is suggested that at the time of inquiry, the appropriate sales office or factory be contacted directly for verification of published specifications and products availability.

© 2014 SEACON
ALL RIGHTS RESERVED